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ABSTRACT

This publication contains seven peer-reviewed papers from a conference on college developmental education with the theme of student success. The papers are: (1) "Reversing the Academic Probation Dilemma" by John Foreman and Nancy Ann Rossi on programming for students on academic probation; (2) "Reading and Writing: Tools for Problem Solving across the Curriculum" by Kimberly Neal and Carol Lewis on problem-solving as a curriculum integration strategy; (3) "Peer Revision: Empowering Basic Writers" by Eileen Master on peer revision including a peer review form, a revision checklist, and guidelines for revising expository compositions; (4) "Layered Diagrams: An Effective Way for Teaching the Paragraph" by Robert W. Holderer on a basic strategy for composing paragraphs; (5) "Some Successful Strategies for Developmental Writing Teachers" by James Boswell on practical strategies for teaching writing and study skills to high risk students; (6) "Card Games and Math Concepts Produce Successful Students" by Paul Hrabovsky Includes instructions for several games; and (7) "Helping Students To Be Organized When Taking Math Tests" by Wayne George on strategies for assisting students with studying for math tests. Most papers contain extensive references. (JB)

SELECTED PROCEEDINGS

FROM THE

14th ANNUAL CONFERENCE

OF THE

PENNSYLVANIA ASSOCIATION OF DEVELOPMENTAL EDUCATORS (PADE)

P A D E P A D E P A D E P A D E P A E P A D E P A D E P A D E P A D E P A D E P A D E P A D E P A D E P A D E

Carolyn Wilkie, Editor

March 1996

Selected Proceedings from the 14th Annual Conference of the Pennsylvania Association of Developmental Educators

March 16-17, 1995

Carolyn J. Wilkie, Editor
March 1996

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FORWARD

Carolyn Wilkie, Editor

The 14th annual conference of the Pennsylvania Association of Developmental Educators (PADE) was held at the Penn State Scanticon Conference and Hotel Center in March, 1995. The conference theme, *Focus on Student Success,* encompassed a broad range of presentations of interest and value to developmental educators. Presenters were asked to submit articles representing their presentations for consideration in this volume. The articles were peer-reviewed using a blind review process. Each submission was reviewed by at least three reviewers.

The enclosed articles represent the topics of programming for students on academic probation (Foreman & Rossi), problem-solving as a curriculum integration strategy (Neal & Lewis), an approach to peer revision (Master), teaching writing through a process of "layered diagraming" (Holderer), success strategies for basic writing classes (Boswell, Jr.), math development through card games (Hrabovsky), and strategies for assisting students with studying for math tests (George). As is intended with conference presentations, the ideas contained in these articles provide stimulation for practioners working with those specific areas.

Gratitude is extended to the following members of PADE's "Research, Monograph, and Papers" Committee for their efforts in soliciting and/or reviewing manuscripts for this publication:

Janice Walters, Bloomsburg University of Pennsylvania
Marguerite MacDonald, Harrisburg Area Community College
Eileen Master, Indiana University of Pennsylvania
Maureen Stradley, Community College of Allegheny County
Bruce Skolnick, Edinboro University of Pennsylvania
Paul Hrabovsky, Indiana University of Pennsylvania
Mary Taylor, Juniata College
John Foreman, Shippensburg University of Pennsylvania
Joan Saroff, Community College of Allegheny County
Louis Tripodi, Clarion University of Pennsylvania
Sally Lipsky, Indiana University of Pennsylvania

Additionally, we appreciate the generosity of the Community College of Allegheny County (Pittsburgh, PA) for printing this publication.

We hope that both our conference and this publication play an integral role in the professional development of PADE members. We invite you to contact any of the members of our Research, Monographs, and Papers Committee with comments or ideas for future projects of benefit to developmental educators.

REVERSING THE ACADEMIC PROBATION DILEMMA

John Foreman, Shippensburg University
&
Nancy Ann Rossi, Shippensburg University

Traditionally, most of the academic support services offered to and provided for the academic probation student are cognitive in nature. Such strategies include tutorial support, study skills instruction, and various seminars or workshops. Unfortunately, many probation students view these support systems as a "burden" and not as an opportunity to reverse an already "bad" academic situation.

Hirsch (1994) states that most students who are in dire need of assistance will not seek help because of feelings of inferiority. He suggests mandatory programs to see that those "risky" students receive adequate attention. Pitcher and Blaushild (1970) list ten reasons for academic failure from among the disadvantaged and underachieving student ranks: lack of potential; inadequate conception of the work involved in succeeding; importance of other activities over study; interference from psychological problems; failure to assume responsibility for own learning; inhibition of language functions (poor reading, writing, and speaking skills); lack of understanding of standards for high-quality performance; selection of inappropriate major; vagueness about long-term goals; and selection of wrong college. They further contend that underachievers in college have been underachieving all of their academic life.

The reasons above closely describe many of the Act 101 probation students at Shippensburg University. Many of the students who did use the available (cognitive) support services still were not attaining good academic standing. In an effort to reverse this situation, an innovative and somewhat unusual group approach was designed, entitled the Study Enhancement Group (SEG). The first SEG group was initiated during the 1994 fall semester. SEG is an important tool for students to explore the affective domain with special emphasis on interests, attitudes, values, and emotions. It gives students permission to talk about troubling issues (both academic and personal) and process their feelings with regard to these issues. SEG also addresses the students' level of self-esteem and how it relates to the students' academic environment. Many researchers note that high self-esteem and academic achievement have a positive correlation (Robbins, Lese, & Herrick, 1993; Weinsheimer, 1993).

The group approach attempts to empower the academic probation student to **critically address those issues that interfere with learning and academic success.** During weekly sessions, the students strive to establish more appropriate behaviors and perhaps attitudes that foster enhanced motivation and grade achievement. According to Zimpfer (1986) students who feel integrated within groups, do better academically.

A description of the Study Enhancement Group (SEG) follows:

Mission of SEG

To give students a chance to put failure into perspective and take charge of the future (Weinsheimer 1993).

Group Objectives

1. To help the student **identify** the obstacle(s) that interfered with his/her learning.
2. To help the student **develop** a plan-of-action to overcome each obstacle.
3. To help the student **re-build** her/his self-confidence as a learner.

Student Population

All academic probation students were required to participate in the SEG group. However, many students did not follow through as required. The chart below provides number of students required to attend, and the number and percentage of those who did actually attend during the fall and spring semesters, 1994-95.

SEG Attendance Results

Semester	Number Required to Attend	Number Actually Attended*	Percentage Actually Attended
1994 Fall	25	5	20%
1995 Spring	69	38	55%
TOTAL	94	43	48%

*Only students who attended at least 8 of the 10 sessions are counted.

Group Design

Students are required to attend ten (10) one-hour sessions. Each group is composed of no more than ten (10) students and a group facilitator. The initial group session begins during the third week of the semester.

Prior to the initial session, all of the students attend an orientation meeting. At the meeting, the program director provides the students with the mission, purpose, objectives, and description of SEG. Students are required to sign a SEG contract. The contract includes information pertaining to attendance and group expectations. Students also receive a SEG manual. The manual includes information sheets, all of the in-session and homework assignments, and a study skills resource packet.

The topics that follow are used to incite student interest, discussion, and reflection during each of the weekly sessions:

Session I - Reactions to the Academic Probation Dilemma
Personal Interference and Academic Performance

Session II - Motivational Issues, Part I

Session III - Motivational Issues, Part II

Session IV - Time Management - A Success Strategy

Session V - Self-Esteem Issues
Self-Check I (The Initial Reflection Activity)

Session VI - Institutional Interference and Academic Performance
Faculty/Course Problems and Academic Performance
Institutional Academic Support Services

Session VII - Study Approach and Academic Performance
Internal and External Advising

Session IX - College Attendance - Is this where I want to be?

Session X - Self-Check II (A Final Reflection Activity)
Student Evaluation of SEG

The group itself is a place of support. Instead of discouraging students and pointing our how they failed, SEG uses the group process, exercises, and assignments to recognize that sometimes other impeding factors come into

play when considering academic success. SEG does not offer opportunities for students to play the "blame game," however, it does encourage them to accept what they have control over. The group process provides adequate time for students to reflect on past behaviors that were not conducive to learning. SEG is also a place where "empowering students means helping them believe that 'I can make learning happen for myself regardless of course difficulty, family difficulties, or other life difficulties'" (Lammers, Jazwinski & Lalonde, 1985, cited Hirsch, 1994). In other words, SEG affords probation students numerous opportunities to take charge of their education, academic achievement and self-efficacy.

Student Reaction to SEG

Somewhat surprisingly, student reaction to SEG was highly positive. Students were given an evaluation tool to complete after the final SEG session. The evaluation procedure was proctored by a graduate assistant to offer the students more anonymity. A total of thirty-nine (39) students completed the SEG stduent evaluation instrument during the fall and spring semesters, 1994-95. The instrument asked students to measure the effectiveness of the group sessions, the SEG Manual, and the group facilitator. Only student reactions of the group are provided here. The Likert scale was used and the results below indicate the combined percentage of students who agreed or strongly agreed with each statement:

*Ninety-seven percent of the students felt that the group helped them to better clarify their responsibilities as a college student.
*Ninety-seven percent thought that the group helped them to better understand the relationship between the academic, social, emotional, and psychological development of a college student.
*Ninety-four percent said that the group helped them to better clarify their academic goals.
*Eighty-nine percent found the group to be a valuable experience for them.
*Eighty-six percent indicated that the group activities helped them to redirect their efforts in changing those non-productive behaviors that tend to have a negative impact upon academic success.
*Eighty-four percent felt that the group helped them to refocus their motivation towards academic success.

SEG Assessment and Evaluation

Data collected thus far for the 1995 Spring Semester indicate that the students who used the Study Enhancement Group (SEG) had a higher overall grade point average, regained good academic standing more quickly, or at least remained on academic probation for the next semester than those who did not.

Grade Point Average Breakdown
1995 Spring Semester

	Number	X GPA
SEG Users	38	1.56
SEG Non-Users	31	1.19

Academic Status Breakdown
1995 Spring Semester

Status	Users*	Non-Users
Good Standing	24% N=9	16% N=16
Academic Probation	34% N=13	16% N=5
Not Permitted to Return	42% N=16	68% N=21

*Users were those who attended 8 of the 10 SEG group sessions

The SEG group concept will be assessed on a continuous basis at the end of each semester to measure group's effectiveness.

References

Droge, D., & Roundy, J. (1992, November). Meeting the needs of at-risk college freshmen through academic advising. Paper presented at the annual meeting of the Speech Communication Association, Chicago, IL.

Ford, J. (1988). The role the academic advisor. Academic Advising Handbook. (ERIC Document Reproduction Service No. ED301097).

Hirsch, G. (1994). Helping students overcome the effects of difficult learning histories. Journal of Develop-

mental Education. 18, 10-14.

Maxwell, M. (1979). Improving student learning skills. San Francisco: Jossey-Bass.

Pitcher, R.W. and Blaushild, B. Why college students fail. New York: Funk and Wagnalls, 1970.

Ringness, T.A. (1975). The affective domain in education. Boston: Little, Brown and Co.

Robbins, S.B., Lese, K.P.,& Herrick, S.M. (1993). Interactions between goal instability and social support on college freshmen adjustment. Journal of Counseling and Development, 71, 343-347.

Weinsheimer, J.D. (1993). Turning point. Belmont, CA: Wadsworth Publishing Co.

Zimpfer, D.G. (1986). Group work in the treatment of test anxiety. Journal for Specialists in Group Work, 32, 233-238.

READING AND WRITING: Tools for Problem Solving Across the Curriculum

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&
Carol Lewis, Penn State New Kensington

PROGRAM DEVELOPMENT

In an attempt to develop not only the academic skills, but also the study skills, of incoming "at risk" students, faculty and staff on the New Kensington Campus have designed an intensive five-week summer program covering basic mathematics, English, and reading/study skills. In the establishment of the Summer Intensive Program (SIP) key elements have become essential. An administrative liaison coordinates a team of three instructors (mathematics, English, reading/study skills), organizes the curriculum development, secures the appropriate classroom space, and communicates with the Director of Academic Affairs, a biology professor, Admissions, and the Advising/Counseling Center. The student population is recommended and recruited by admissions and counseling personnel who identify, from placement test scores and personal interviews, "at risk" students. Students who test "deficient" in two of three areas--math, English, and/or reading--on the Penn State Placement Test qualify for the program; students who enter the University with an adjusted high school grade point average below 2.0 also qualify. Letters and phone calls invite prospective students into the program, limited to fifteen individuals.

Over the last four years, faculty and staff have experimented with the program's curriculum. In 1992, instructors chose the theme "Working" and created a thematic unit that included student-centered discussions, narrative text readings and personal writing, study skills focusing on post reading skills, and college-level vocabulary lists. In 1993, the instructors chose the theme "Problem Solving Across the Curriculum" and designed integrated lessons which highlighted problem solving skills needed in all disciplines, student-centered discussions, and study skills applications to expository and narrative text taken from Penn State courses. In 1994, the program experimented with a traditional approach. The mathematics, English, and reading classes were taught as separate developmental courses; team work was at a minimum. In 1995, instructors, evaluating the three years of curriculum experimentation and concluding that the "Problem Solving Across the Curriculum" unit offered students and instructors the most practical and rewarding experience, repeated the '93 curriculum.

This paper will explain, via description, discussion, and day-by-day activities, the integrated curriculum of the "Problem Solving" program, concentrating on the connections

made between the reading and writing instructors and their studies. The marks of success defined in the Conclusion should encourage planners of other college preparatory programs to consider similar attempts to integrate problem solving skills across the curriculum.

"PROBLEM SOLVING ACROSS THE CURRICULUM-AN OVERVIEW

The curriculum objectives for the Summer of 1993 and 1995 were designed to introduce thinking and problem solving across disciplines. Cooperatively, the reading/study skills and writing instructors for this program develop lessons which demonstrate the connections between the steps and procedures needed to solve mathematical problems, as well as to effectively solve a reading assignment and to solve the problem of composing a paper. Therefore, instructors and students work toward achieving the following goals:

- to recognize relationships and integrate knowledge across different subject areas
- to actively use reading, writing, listening, speaking, and problem solving skills.
- to build competence and self-confidence

Just as literacy educators believe that advanced literacy is necessary to function in an academic community and that advanced literacy is demonstrated in the ability to think critically (Spires, Huntley, Johnston & Huffman, 1993), so do the Summer Intensive Program instructors believe. As a result, they carefully plan each day's activities.

First day activities begin with a group problem solving exercise (taken from a Psychology chapter that students will actually find in a reading assignment during Week Two of the program). After forty-five minutes of problem solving, every student has worked with every other student and has experienced the satisfaction and frustration of problem solving. Students conclude that problem solving is "finding the easiest way to reach a goal that isn't easy to reach." They describe the process as a series of "active efforts" and "seeing" what is given, what can be assumed, and what must be accomplished in order to reach an answer. They discover problem solving approaches (trial and error, forming subgoals, working backward, searching for similarities, drawing visual representations for words and ideas, and analyzing means to ends); they label categories of problems (patterns, analogies, parts of a whole, logical steps, steps with rules); they describe barriers to their problem solving (irrelevant information, stubbornness, narrow-mindedness, fixed thinking, oversight, lack of confidence). In the five-weeks following this opening day, students again and again experience and identify these same problem solving approaches as they discover new ways to read text, study text, create text, and evaluate text.

READING AND WRITING CONNECTIONS

The reading and writing instructors agree that relevant connections can be made between reading and writing. Students benefit from learning reading/study strategies one hour, applying them on their reading assignments within the

hour, transferring them into their writing processes during another hour, and recognizing their value to them as math problem solvers in another hour. Three hours a day, five days a week over a five-week period, instructors and students make connections. Reading assignments are the catalyst for writing assignments. The goal is to expose students to reading, writing, and problem solving challenges that are similar to challenges students are likely to face as freshmen and sophomores at Penn State. Therefore, the curriculum is based on reading selections from Penn State textbooks: Math 3 (developmental mathematics), Psychology 2 (introductory psychology), Humanities 101 (an ethics course), and Biology 101 (introductory cell biology). Moving at similar paces, using similar terminology, the reading and writing instructors spend each week focusing on one of the four academic disciplines: mathematics, the social sciences, the humanities, and the natural sciences.

Vacca and Vacca (1989) describe the tightrope that teachers walk between content and process: "When it comes to reading . . . a content teacher's job is not to teach skills per se but to show students how to use reading effectively to comprehend and learn from text materials" (p. 9). In an effort to move students into metacognitive awareness, thereby leading them into a more "active" role, the reading instructor bases her course information and assignments on theories and techniques developed by Atkinson and Longman (1985), Carbo, Dunn and Dunn (1986), Deem (1993), McWhorter (1994), Smith (1989), Tompkins and Hoskisson (1991) and Vacca and Vacca (1989). Beginning with a written analysis of students' feelings toward reading--"Why Read?"--the reading instructor introduces students to specialized approaches that must be adapted and applied to the distinct characteristics and patterns of reading in each of the four disciplines. Furthermore, she guides students through the analysis of their own learning styles/modalities, explores patterns of academic thought as seen in textbook writing, teaches students how to read and analyze graphs, how to develop study skills applicable to a variety of disciplines, and how to utilize writing to learn.

Based on Linda Flower's Problem Solving Strategies and Bill Coles' writing workshop format, the writing instructor designs writing assignments that stem from each of the four academic disciplines. Students take initial time to consider "Why Write?" and then they respond in a short paper. Next, students consider how writing connects with mathematics, as they summarize a textbook explanation of fractions and solve a fractions problem in numbers, symbols, and words, writing out their problem solving process in a dialogue. Reading in psychology stimulates the writing of an analysis of a personal problem, defining it and reflecting on possible solutions. Reading excerpts from Brave New World provides the opportunity to raise controversial issues, to take a stand, and to explore an opinion by supporting it with examples and illustrations. Finally, studying the biological concept of mitosis challenges students to synthesize

information from a variety of sources, to create note cards, to organize facts, write, and then draw a five-phase chart.

Students share their weekly writings in a workshop environment that forces them to think not only about their own reading and writing, but also everyone else's. At work in the writing classroom are the ingredients for success that Nancie Atwell and Robert Brooke (1991) have defined: a writer's workshop environment wherein pupils are allowed to use their innate capacities and increase their chances of becoming successful readers and writers who make connections between what they are being asked to address in an assignment and what and how they choose to address that request. Both researchers agree that writers need ownership of their topics; they need opportunities to make writing a way of thinking about their own ideas, their own logic. In addition, Brooke believes that writers need to experience writing as a process of putting words on paper, hearing reactions, experiencing messiness and change, and seeing what experienced writers do to compose. Brooke has observed that through modeling, discussions, interaction, and peer/teacher feedback, students begin to improve their thinking about what they have to say and how they might say it.

Summer Intensive students are afforded the opportunity to think about and to experience the natural connections between reading and writing. Continuous references are made to the similarities between "What Readers and Writers Do," and what they themselves, as readers and writers, are doing daily. Butler and Turbill (1984) draw the parallels clearly in the following outline:

WHAT READERS DO	WHAT WRITERS DO
Before	
Readers use knowledge about	Writers use knowledge about
• the topic	• the topic
• syntax	• syntax
• phonology	• phonology
Readers bring expectations cued by	Writers bring expectations cued by
• previous reading experiences	• previous writing experiences
• format of the text	• previous reading experiences
• purpose for reading	• purpose for writing
• audience for reading	• audience for writing
During	
Readers read to	Writers prewrite/draft to
• predict outcomes	• gather ideas
• monitor predictions	• organize ideas
• create meaning	• write a rough draft
Readers reread to	Writers revise and edit to
• discuss text	• discuss text
• interpret meaning	• interpret meaning
• clarify meaning	• clarify meaning
• examine the impact of words/sentences/paragraphs to the whole text	• examine the impact of words/sentences/paragraphs to the whole text
• make notes	• identify and correct

mechanical errors

After

Readers	Writers
• respond in many ways	• get response from readers
• reflect on the reading	• give response to readers
• feel success	• feel success
• want to read again	• want to write again

READING AND WRITING CONNECTIONS

To further connect reading and writing similarities across disciplines, the students and both instructors meet on Monday mornings for a two-hour discussion. Student-centered discussions focus on the reading process just practiced, ideas generated from the weekend reading assignments, and the brainstorming of writing topics and strategies. The campus conference room, designed for meetings and seminars, affords the group an atmosphere for collaboration: comfortable, upholstered chairs around a large conference table, a television/VCR system, blackboard, and ample space for breakout groups.

Tuesday through Friday mornings, the reading instructor conducts separate, hour-long periods taught in a variety of styles, outlined in a very traditional type of course syllabus. A brief description of the reading portion of the course is given to students, along with objectives, a detailed grading policy, a general policy on attendance, exam, quiz, and make-up policies and information, and an academic integrity statement. In addition, students receive a course outline which includes daily topics, quiz, and test dates. Reading and study skill sessions are held in a traditional classroom with students seated in rows, listening, taking notes, asking questions, working in groups, and discussing interactively. The classroom dynamics is dependent upon the topic being discussed.

Believing as Goodman (1986) that language should not only be relevant but taught meaningfully and as a whole, the reading instructor attempts to teach all skills and techniques in context. Utilizing the problem solving scenarios and small group activities helps develop the students' communication skills and brings most members of the class together as a team, in a short period of time. Both learning styles and active listening are introduced through viewing and discussing parts of "Dead Poet's Society" and "Sweatin' to the Oldies." Rather than explaining their value, the instructor asks pertinent questions which lead to student brainstorming and critical thinking. All assignments deal with the course textbook, and all vocabulary terms are taken directly from the assigned textbook chapters.

Tuesday through Friday mornings, the writing instructor conducts a workshop revolving around samples of student and professional writings. To force students into a more thoughtful reading of the syllabus, to make them think about the writing and the writing workshop format that they are going to participate in, and to show the students the type of thought and effort that the instructor is willing to put into

the course, the writing instructor designs the syllabus as a personal letter to the class and announces that there will be a quiz on the syllabus the next day. The syllabus exercise begins the "push and personalization" that author Theodore Sizer in Horace's Compromise notes that students need from teachers, the push for careful reading, careful thinking, and careful writing. The next day, students are quizzed on the syllabus and challenged to respond in a serious and thoughtful way, drawing conclusions and constructing complete sentences for answers. Consequently, reading, interpreting, and using the course syllabus becomes a valuable learning activity and preparation for paying attention to details.

For the class session, students rearrange their desks into a large circle or several small circles, depending on the workshop exercise. The ground rules for discussions about student drafts are set: (1) Writers of example pieces will remain anonymous, so the masculine and feminine pronouns (he, she) will be used to refer to the writer; (2) discussions will begin with the instructor asking, " What would you like to say to this writer about what you liked or what you felt was a strength or what you heard clearly and understood or how he or she addressed the assignment?"; (3) discussions will include complementing or questioning clarity, focus, convincing evidence or examples, order of ideas--any area of content, rather than finding fault with grammar/mechanics, unless those problems have created misinterpretations; and (4) all comments will include specific references to the paper.

The instructor collects student drafts at 9:00 a.m., selecting portions or entire pieces as examples of points that she wants students to discover, xeroxes copies for all students, and prepares a few lead questions that will begin a writing conversation. Writing becomes a process of understanding the assignment, generating an individual mental and written response, getting and understanding feedback from peers first and instructor second, then revising to establish clearer meaning for the reader, getting more feedback, and then revising one more time. In addition to collaborative drafting, students practice collaborative editing. Every Thursday, students discuss what problems they see in individual sentences or within paragraphs, attempting to explain why the problem occurs, and whether or not it can be improved or simply needs to be rewritten. On Fridays, students take an editing quiz and discuss their proofreading skills.

MARKS OF SUCCESS

Marks of success were evident during and at the end of the program in 1993. Throughout the five weeks, students worried and complained about the difficulty of the vocabulary words they were expected to learn. However, each week new skills were built integratively that demonstrated the need for and success of "context" learning. When the biology lesson began and students voiced concern, "I can't pronounce these words let alone learn them," the reading instructor

emphasized the importance of learning words in context, via multiple writings and visualization of the words. For instance, after studying the biology video lecture, utilizing the various study resources, and constructing the five-phase chart, ten out of thirteen students earned perfect scores on the vocabulary quiz; two missed only two definitions, and one (who had not taken an active role) missed nine.

Changes in students' approaches toward their assignments became apparent. Students on their own used more organization and utilization of post-reading techniques. Students effectively took notes with summary, Cornell, and mapping strategies. Students were frequently overheard saying, "Chunking the info actually helped," "Using a schedule and a to-do list did cut my study time," and "I no longer panic taking a math test." Class participation and insightful questioning also increased as the program progressed.

Changes in students' thinking about their writing processes was another mark of success. Every writing assignment included a cover page of reflection about the writing process. Over the five weeks, student comments became more evaluative and comparative in nature. Changes in students' approaches to developing a topic improved. They tended to move more quickly to relevant, specific illustrations or examples and demonstrated more effective paragraph focus. Descriptions of particular times, places, people, and circumstances resulted in convincing body paragraphs of support for a few thoughtfully chosen (rather than many haphazardly written) generalizations. Changes in sentence structure were obvious. From Week One writing to Week Five writing, total numbers of paragraphs per paper increased; total sentences constructed increased; numbers of complex and compound-complex sentences increased, and numbers of simple sentences decreased. Students demonstrated a better command of their language as they experimented with a wider variety of subordinators, transitional phrases, and conjunctive adverbs with semi-colons.

Exit exam results demonstrated student success. The structure of the reading/study skills exit exam was such that the application of skills was more important than the recall of facts. The test took the form of being both objective and subjective, utilizing all forms of test taking questions. Demonstration of mapping skills, reading a variety of graphic illustrations and explaining how they would teach another student to read "actively" were just three of many questions designed to test understanding. Students performed satisfactorily or better on an exit writing exam which was graded by an English faculty not affiliated with the program; every student was recommended for the fall semester college composition course.

Furthermore, at the conclusion of the program, all thirteen students rated the program, "valuable." During their fall semester, seven of thirteen students responded to

an October evaluation that echoed the same positive assessment. They appreciated the rigors of the summer program because those rigors prepared them for the demands of their fall semester course work. All agreed that the study skills, reading, writing, and math skills that they had learned or refreshed were being put to practical use. To date, nine of the thirteen students have achieved a 2.0 or higher cumulative grade point average; two will graduate in August with dual degrees in the technologies; the others are pursuing four-year degrees or investigating other educational opportunities.

CONCLUSION

Our Summer Intensive "at risk" readers and writers develop competency in reading and writing in a variety of discourse communities, due to the structure of the program. The assignments, the exercises, and the collaborative working atmosphere force students to learn study techniques, reading, writing, and evaluation skills by connecting the acts of reading, writing, and problem solving. Students are engaged and growing. Mike Rose (1983) applauds opportunities like this program, when student readers and writers are presented a time to be ambitious and to err. "Academic topics as much as personal ones demand a working through, a talking to and making meaning for the self" (p. 128), and "making meaning" is what students practice in this summer program.

REFERENCES

Atkinson, R. H., & Longman, D. G. (1985). Reading enhancement and development. St. Paul: West Publishing Company.

Bartholomae, D. & Petrosky, A. R. (1986). Facts, artifacts and counterfacts: Theory and method for a reading and writing course. Upper Montclair, NJ: Boynton/Cook.

Brooke, R. E. (1991). Writing and sense of self: Identity negotiation in writing workshops. Urbana, IL: National Council of Teachers of English.

Carbo, M., Dunn, R., & Dunn, K. (1986). Teaching students to read through their individual learning styles. Englewood Cliffs: Prentice Hall.

Coles, N. (1986). Empowering revision. In D. Bartholomae & A. R. Petrosky (Eds.), Facts, artifacts and counterfacts: Theory and method for a reading and writing course (pp. 167-98). Upper Montclair, NJ: Boynton/Cook.

Coles, W. E., Jr. (1985). What makes writing good. Lexington, MA: D. C. Heath.

------. (1988). Seeing through writing. New York: Harper & Row.

Deem, J. (1993). Study skills in practice. Boston: Houghton Mifflin Company.

Elbow, P. (1973). Writing without teachers. New York: Oxford University Press.

Flower, L. (1989). Problem solving strategies for writing. New York: Harcourt Brace Jovanovich.

Goodman, K. (1986). What's whole in whole language? Portsmouth: Heinemann Educational Books, Inc.

McWhorter, K. T. (1994). Academic reading. New York: Harper Collins College Publishers.

Rose, M. (1983). Remedial writing courses: A critique and a proposal. College English, 45, 109-128.

Smith, B. D. (1989). Bridging the gap: College reading (3rd ed.). USA: Harper Collins Publishers, Inc.

Spires, H. A., Huntley-Johnston, L,. & Huffman, L. E. (1993). Developing a critical stance toward text through reading, writing and speaking. Journal of Reading, 37, 114-122.

Tompkins, G. E. & Hoskisson, K. (1991). Language arts: Content and teaching strategies. New York: MacMillan Publishing Company.

Vacca, R. T. & Vacca, J. L. (1989). Content area reading (3rd ed.). Glenview: Scott, Foresman & Company.

Wallace, D. (1993). Teaching collaborative planning: Creating a social context for writing. In L. Flower, D. Wallace, L. Norris, & R. E. Burnett (Eds.), Making thinking visible: Writing, collaborative planning, and classroom inquiry (pp. 48-66). Urban, IL: National Council of Teachers of English.

Wilkerson, R. M. (1992). Integrated teaching and learning: A developmental perspective. Kappa Delta Pi Record, 93-96.

Wood, K. D. (1992). Fostering collaborative reading and writing, experiences in mathematics. Journal of Reading, 30, 96-103.

PEER REVISION: EMPOWERING BASIC WRITERS

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With the current emphasis upon collaborative, student-centered learning, and the acknowledged value of creating a community of writers, faculty are very interested in techniques which help students become more responsible for their own learning. Peer revision helps students believe in themselves and their abilities.

Too often, developmental/basic writers are heavily dependent on the teacher. When using peer revision as a teaching/learning strategy, instructors become facilitators rather than the sole figure of autonomy in the classroom. Peer revision sessions provide the writers with a real audience to give them immediate feedback. Students become colleagues as they work together to improve their writing skills.

Developmental writers, prior to their peer revision experiences, felt no ownership or responsibility toward their writing. Peer revision strategies energize and empower basic writers. Participants in the group revision strategies give meaningful feedback to one another as they model the behaviors of cooperative learning and positive interdependence instead of competition. The behaviors evident in peer revision sessions help to improve social skills and break down cultural and gender barriers as it fosters affective as well as cognitive development.

William Perry, in his book Forms of Intellectual and Ethical Development in the College Years, states that learning, as we must understand it today, involves assimilation into communities of knowledgeable peers. Students should be allowed to define their individuality as interdependent members of their academic community. Thom Hawkins (1932), like Bruffee, emphasized the emotional bond or "intimacy" which results from shared status, what social psychologists call "identification" (Gillam 1994).

Peer groups require careful planning, modeling, maintenance, management, and reflection for all the participants. Too often students go through the motions of peer response without providing appropriate feedback. Some are reluctant to criticize their peers so they only praise their classmates' writing. Others focus on an area that does not need correction or become overly critical of their classmates' writing. For many teachers, it is hard to justify using valuable class time for peer groups only to watch students talk in circles without succeeding to improve each others' writing. But teaching students to help each other make

improvements from draft to draft in a "writing community" (Bruffee 1984) is time well invested. Successful peer revision happens as a result of thoughtful, careful planning, nurturing, and implementation.

We must be wary of imposing our own revising behaviors on our students. If we are well-informed of revision strategies research and can make our students aware of their individual options, revision techniques can be personally adapted and expanded. "No picture of revision is complete until it includes all that is known and observed about a variety of revision behaviors among writers" (Harris 1989).

A critical role in peer revision is played by the teacher/facilitator who establishes the ground rules for the implementation of the work to be completed. Successful peer revision groups develop through several stages, phases, or levels. Wendy Bishop (1988) identifies that the keys to success in peer response groups include cultivating confidence in peer response and expertise; being able to offer criticism to members; developing "a common vocabulary for discussing writing"; and learning to identify major and minor writing problems. Bishop emphasizes that "teaching each other to talk about writing can be initiated by the teacher, reinforced by the class text, and nurtured by the whole class discussion, but it will be brought to fruition in the group itself as members learn to improve their writing." Roleplaying and modeling with sample essays can be used to initiate the peer revision process, and "groups can work to answer set questions or learn to develop their own critical concerns for papers."

Peer revision must begin with an attempt to re-acculturate students. Diana George (1984) and Thomas McKendy (1990) found that students have a tendency to initially distrust peer commentary. Often, students don't recognize the importance and usefulness of the comments peers offer. Writers must learn to listen critically and be as open to advice to peers as they would be from an instructor. Most students have experienced the traditional classroom, so they have to learn, often with resistance, to grant authority to peers rather than to a teacher.

Revision works best after confidence and skill have been built up through freer kinds of writing. Emphasis should be placed on the "human dimension" of feedback, keeping response open. Teachers must convey that writers are in charge of their revision and shouldn't feel like they're on a "chopping block" during peer response. Teachers must "show students new and creative kinds of response". Writers need to read each other's work " to give each writer a sense of how his or her words were experienced" by an audience. (Elbow 1990).

McKendy (1990) incorporates a class exercise to assure the validity of peer judgment. By having students sort college placement essays into higher and lower level groups and then comparing their results with original faculty groupings, a high correlation of placement choices is found that makes students realize their ability to review others' writing. To trigger response within groups, George (1984) implements "recapitulation," which involves each student talking through his or her essay, articulating a monologue to generate questions and suggestions from those listening. Kristi Kraemer (1993) suggests the "readaround," in which copies of a writer's text are distributed and student responders highlight strengths. She also points to having students respond about response sessions and following revisions.

The success of the peer revision groups depends primarily upon the quality of the initial experience. First, model the peer revision process. Have students examine several papers and suggest revisions. The instructor should critique the same papers and then compare suggestions for improvement, emphasizing the need for positive, specific, and helpful comments. The instructor should clarify why certain kinds of feedback discourage a writer. The modeling should continue throughout the peer revision stages, phases, and levels.

Initially, students should respond to the overall organization of the paper and then work through the essay's support, grammar, sentence structure, and mechanics. The instructor should define reader-based and criterion-based feedback. When everyone is satisfied with the substance of the comments, students should be assigned to groups. Each group should reflect a balance of students' personalities, skills, and racial and ethnic backgrounds.

Providing a variety of clear and focused guidelines for students to use during revision sessions is another important ingredient in peer revision work. The task and the teacher's role in setting those guidelines must stimulate active learning, which will lead to an important outcome. Students that are divided into groups to examine drafts and to "discuss" their papers without specific guidelines will flounder. An early worksheet might ask broad-based questions about thesis, support, and each reader's general disposition toward a paper. Throughout the semester, worksheet questions can become increasingly more sophisticated as students become more competent as peer reviewers. An advanced worksheet could ask probing questions about content, organization, and style. Another useful strategy is to vary the tasks; use several different worksheets or guide questions with the students so that they do not become bored with the same old thing. Students can also create their own guide sheets to assist themselves in the revision process. Doing this will demonstrate

that a different assignment may require a different focus for the revision stage of the writing process (Beach 1989). Peter Elbow and Pat Belanoff in A Community of Writers (1989) write of the various levels of revision. Students need to work with different guidelines for the different levels of (1) "reseeing, rethinking, or changing the bones"; (2) "reworking, reshaping or changing the muscles"; and (3) "copyediting or proofreading."

As students work together, the instructor should monitor the activity, being careful not to be an interloper, but rather a facilitator. "The purpose of collaborative learning...," Bruffee points out, "is to help students gain authority over their knowledge and gain independence in using it." In the classroom, "teachers create social structure in which the students can learn to take over the authority of learning as they gain the ability and confidence to do so" (Short Course in Writing 1985). A teacher joining a group can easily undermine the development of that authority and that confidence. All attention will turn to the teacher as the central figure in the learning process. Still, the teacher should monitor each group's efforts, offering suggestions and support. The teacher should emphasize that no response is wrong to ensure that peer revision is a positive experience for all involved. At intervals, the teacher could ask the students to do five minute non-stop writings describing what's going on in the groups. A summary of that feedback could be presented at the next class.

Near the end of each revision session, the instructor should allow the students time to react to the session. It's important to find out what went well and what went wrong and to discuss how to overcome group problems. Elicit suggestions from the groups to improve future sessions. At this point in the revision process, the teacher must assume the role of synthesizer. This help to reinforce what has been learned as well as establish the value of learning communities and of peer revision as an intellectual process. By synthesizing the results of the individual groups and connecting that synthesis with the consensus of the larger community of knowledgeable peers -- the teacher's own community -- the teacher helps individual revision groups move into the larger community (Weiner 1993).

In the formative weeks of peer revision, groups need ongoing guidance and support. Students need assurance that the process is meaningful because concrete results are not immediately apparent. Instructor and student impatience is a major reason for the failure of peer revision groups. However, if the students and the instructor form a collaborative partnership to foster the peer revision process, everyone will gain a valuable educational tool. Collaborative peer revision is a means to generate knowledge as a social construct, not merely a new configuration of students and desks in the classroom.

References

Bartholomae, D. and Petrosky, A. (1986). Facts, artifacts, and counterfacts: theory and methods for a reading and writing course. New Hampshire: Boynton/Cook.

Bartholomae, D. (1980). A study of error. College Composition and Communication 31, 253-269.

Beach, R. (1989). Showing students how to assess: demonstrating techniques for response in the writing conference. In Chris M. Anson (Ed.), Writing and response. Illinois: NCTE.

Berlin, J. (Sept. 1988). Rhetoric and ideology in the writing class. College English, 477-494.

Bruffee, K. (Nov. 1984). Collaborative learning and the 'conversation of mankind'. College English, 635-652.

_____, (1985). A short course in writing (3rd edition), New York: McGraw-Hill.

Ede, L. (1989). Work in progress: a guide to writing and revising. New York: St. Martin's.

Elbow, P. (1981). Writing with power. New York: Oxford University Press.

Elbow, P. and Belanoff, P. (1989). A community of writers, New York: McGraw-Hill.

Emig, J. (1971). The composing process of twelfth graders. Illinois: NCTE.

Faigley, L. (1989). Judging writing, judging selves. College Composition and Communication, 395-413.

Foxworthy, D.J. (September 1991) The process of revision. Composition Chronicle.

Freedman, S. (Ed.). (1985). The acquisition of written language: response and revision. New Jersey: Ablex.

Gallo, D. (Ed. et al). (1988). Focus on collaborative learning. Illinois: NCTE.

George, D. (1984). Working with peer groups in the composition classroom. College Composition and Communication, 320-326.

Gillam, A.M. (1994). Collaborative learning theory and peer tutoring practice. In Joan A. Mullen and Ray Wallace (Eds.), Intersections. Illinois: NCTE.

Lane, B. (1993). After THE END: teaching and learning creative revision. New Hampshire: Heineman.

Moffett, J. (1988). Coming on center: essays on English composition. New Hampshire: Boynton/Cook.

Mohr, M.M. (1984). Revision: the rhythm of meaning. New Jersey: Boynton/Cook.

Murray, D. (1991). The craft of revision. New York: Reinhart and Winston.

Myers, G. (Feb. 1986). Reality, consensus, and reform: rhetoric for composition teaching. College English, 154-174.

Onori, C. (1989). The student, the teacher, and the text; negotiating meaning through response and revision. Writing and response: theory, practice, and research. 231-260.

Phelps, L.W. (1989). Images of student writing: the deep structure of teacher response. Writing and response: theory, practice, and research, 37-57.

Ritchie, J. (1991). Connecting writers' roles to social roles beyond the classroom. In Robert E. Brooke (Ed.), Writing and the sense of self. Illinois: NCTE.

Schiff, P. (1982). Responding to writing: peer critiques, teacher-student conferences, and essay evaluation. In Toby Fulwiler and Art Young (Eds.). Language connections: writing and reading accross the curriculum. Illinois: NCTE.

Trimbur, J. (Oct. 1989). Consensus and difference in collaborative learning. College English. 602-617.

Weiner, H. (1993). Collaborative learning in the classroom: a guide to evaluation. In S. Morahan (Ed.). Background readings. Boston: St. Martin's Press.

Willis, M.S. (1993). Deep revision New York: Teachers and Writers Collaborative.

Peer Evaluation Guidelines

LISTEN - Both the peer evaluators and the writer must be careful listeners.

RESPOND - The audience must first respond to the overall message and the organization of the piece.

- Then respond to the grammar, sentence structure, and spelling.
- Give specific reactions to specfic parts of the piece.

No response is wrong

HOW TO RESPOND - Make positive and negative comments.
Ask questions.

TYPES OF RESPONSES

Summarizing - Can you sum up the main point of the piece of writing ?
Can you tell the author what you think he is saying ?

Pointing - Point to the parts that you think are good.
Point to weak parts, parts which are ineffectual.
Point to where it seems to wander.
Point to where it seems unclear.

Telling - Tell the author how you felt as you read his work.
Be subjective but stick to the paper at hand.

REMEMBER:

Take your time critiquing.
Reread papers is you need to.
Be honest.
Be specific.

As a peer evaluator, you are not there to change the author's page. Your job is to make his writing clearer.

The peer evaluators are an audience and should give their reactions.

Peer Review Form

Reviewer _____ Date _____

Writer of Essay _____

A. Thesis/Controlling Idea/Focus

1. Your main point in this paper seems to be that

2. This point might be clearer if you

B. Support

1. You use the following reasons and/or examples to support your thesis:

2. However, you might strengthen/clarify that support if you

C. Plus and Minus:

1. The thing I liked most about this paper is

2. This paper would be better if you

Author:_____
Reviewer:_____

REVISION CHECKLIST

* What is your **initial reaction** to the essay ?
    * What do you **like** ?

    * What do you **dislike** ?

* What is the **essay's focus** or **controlling idea** ?

    * If it **isn't clear**, what **changes** need to be made ?

* What are the essay's **main points** ?

    *If any **ideas stray**, what **changes** need to be made ?

*Where would **additional specific details** be appropriate ?

* Is there a **connection between ideas** ?

    * If not, how would you **fix** that ?

* Is the **conclusion an integral part** of the essay ?

    * How could it be **strengthened** ?

CONTENT

1. Does the introduction include a thesis statement/focus/controlling idea AND attract the audiences attention ?
2. Does each sentence or each paragraph in the body discuss only one main idea ?
3. Is each paragraph well-developed; that is, does each paragraph have a topic sentence supported with specific details, facts and statistics, examples, incidents, or reasons ?
4. Does each idea or paragraph contribute to developing the topic ?
5. Is the topic sufficiently developed; that is, are there enough points included to support the main idea or thesis ?
6. Does the concluding sentence or paragraph summarize the essay and make a final impression on the reader ?

ORGANIZATION

7. Does the conclusion relate logically to the main idea or thesis statement ?
8. Does the essay follow a logical order of development ?
9. Are transitions used to link ideas ?
10. Is there a smooth and logical flow ?

STYLE

11. Is the essay's language appropriate to the audience ? Are clear and specific words used ? Is wordiness avoided ?
12. Are technical terms and unusual vocabulary defined and explained ?
13. Does the word choice accurately reflect the appropriate tone, or the writer's attitude toward the subject ?
14. Are sentences clear, varied, and appropriate to the audience ?
15. Is the title interesting, and does it suggest the essay's main idea ?

LAYERED DIAGRAMS: AN EFFECTIVE WAY FOR TEACHING THE PARAGRAPH

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When students enter our basic writing classes, they often lack a system of coherent strategies for composing even the simplest of paragraphs. As a result, faculty members often find themselves teaching and reteaching strategies for composing paragraphs, only to find that students still compose discourse consisting of strings of unrelated sentences that happen to lie next to each other but are not related to each other (Brostoff, 1981). Much of this problem stems from the student's failure to perceive and to formulate connections between what Mina Shaughnessy (1976) terms as levels of abstraction within paragraphs. Students cannot draw relationships between assertions and support to back those assertions. A key to overcoming these problems is not merely providing students with model paragraphs coupled with abstract pointers and admonitions; rather, the key is in diagramming paragraphs in such a way that students can clearly perceive relationships within and between sentences. A step forward in this direction is a method of paragraph diagramming that I have derived from the ideas of Francis Christensen (1967), an early pioneer in composition theory who fought against prevalent assumptions that writing is an inherent creative ability that only a few students possess.

Francis Christensen, a visionary of the early 1960s, gave the profession a radically new idea for a system to help students create ideas within their work. He gave the profession a new way for approaching the sentence: the Generative Grammars of the Sentence and the Paragraph. He designed these systems to approach grammar as a process, not a product (Christensen, 1968). Instead of merely expecting students to write better, his system taught them a process. Christensen felt that problematic sentences and paragraphs that nonproficient students create would eventually disappear if they could see their writing in pictorial form as they gained practice in embedding layers of supporting ideas to their lean, stark sentences.

According to Christensen, paragraphs are formed from four structural principles: addition, direction of modification and movement, abstraction, and texture. The first two principles, addition and direction of modification and movement, define the grammatical structure of the sentence. Addition refers to the action of composing, the formation of base clauses within sentences. Direction of

modification and movement refers to subordinating phrases and clauses that function as modifiers and as focusers of direction within sentences. Abstraction is the principle that creates meaning through the interaction of addition and direction of modification and movement. Texture refers to the relative richness or thinness created in sentences and is determined by the quantity and quality of the direction of modification and movement within sentences. From these principles come meaning within the paragraph. Paragraphs are sequences of structurally related sentences that Christensen sees as a web of subordination and coordination.

These two webs can be further subdivided into two functions: grammatical and semantic (D'Angelo, 1975). The grammatical functions connect sentences through precise words, such as pronouns, transitional words, repetitions of words (or their synonyms), and parallel structures. The semantic function establishes relationships within and between paragraphs. Thus, both Christensen and D'Angelo see sentence and paragraph alignment (which I will refer to as Christensen diagrams) more complex than traditional grammar and handbooks define them. Furthermore, the analysis done by Christensen and D'Angelo suggests that there is a closer connection between paragraph elements than many have previously believed (Christensen, 1967; D'Angelo, 1975).

In creating a diagram of the network of connections within a given text, one must view the sentence as an integral unit, locked internally to itself as well as externally to those sentences that surround it. That is, one must look inside the sentence to determine how a given component relates to all the others that make up the sentence. One looks outside the sentence to determine its relationship with the other sentences of the paragraph.

As phrases and clauses are either subordinated or coordinated to each other on the sentence level, individual sentences will also subordinate or coordinate with each other on the paragraph level. The base clause of each sentence thus becomes analogous to the topic sentence of the paragraph (which Christensen assumes to be the first sentence of the paragraph for the purpose of his diagrams). The subordinate phrases and clauses that modify the base clause of the sentence become analogous to that group of sentences that support the topic sentence of the paragraph. Therefore, once one finds the base clause (on the sentence level) or the topic sentence (on the paragraph level), one places it at the most prominent level and indents all subordinate materials on subsequent levels on the basis of whether they modify the base unit or a unit subordinating the base unit. Thus, the base sentence (on the paragraph level) or the base clause (on the sentence level) is placed in position one, and all elements that directly support the base element are put on level two. If an element modifies a given level-two subordinate element (instead of the base level-one element), it is then placed on level three. If an element modifies a level-three element, it is placed on

level four, and so on. Consequently, on both the sentence and paragraph levels, the diagram takes on a multi-layered effect that graphically shows the leanness or richness of the text. Moreover, it gives them a sense of how the text has been constructed so that they can better discern the presence of features that could point to a lack of writing fluency.

To illustrate Christensen on the sentence level, I have diagrammed the opening sentence of William Faulkner's A Rose for Emily as follows. To clarify relationships, I have numbered each level to clarify its level of subordination.

2 When Miss Emily Grierson died,
1 our whole town went to her funeral:
2 the men through a respectful attention for a fallen monument,
2 the women mostly out of curiosity to see the inside of her house,
3 which no one save an old manservant--/--had seen in ten years.
4 /a combined gardener and cook.

With the exception of the level-four appositive, the diagram lists the sentence as it was originally written. The slash mark (/) indicates that an embedded element was removed from the phrase or clause. The independent clause "our whole town went to her funeral" takes the level 1 position because it is the base unit upon which all other phrases and clauses unfold. The initial adverbial clause "When Miss Emily Grierson died" assumes a level 2 position because it is subordinate to the level 1 clause.

Following the base clause at the level 1 position are two absolute phrases that also modify the base clause. Both of these phrases assume the level 2 position because they coordinate each other, and as equals, they are both subordinate to the base clause. The clause "which no one save an old manservant--/--had seen in ten years" assumes a level 3 position because it describes the idea of "house," located in the level 2 sentence directly above it. This clause is thus subordinate to the one above it, and its indentation to level 3 pictures this relationship.

Embedded in the level 3 clause is the appositive "a combined gardener and cook." Because this phrase falls within another clause, the virgule (/) signifies that the phrase has been removed. Because this appositive serves to clarify the identity of the manservant, it assumes a level 4 position because the appositive is subordinate to the level 3 adverbial clause that precedes it.

While the rich layer of embeddings goes beyond the capability of most freshmen, this method for diagramming sentences can point out to readers in graphic form that a student has not embedded anything within sentences.

In diagramming paragraphs, the reader assumes that the opening sentence of any paragraph is the lead sentence, and

it is placed at the level-one position. Although the first sentence is not necessarily the topic sentence of the paragraph, it still becomes a level-one sentence so that other sentences can either be coordinate or subordinated to it. The following sentences should start at level two and work down. In diagramming the paragraph, the reader must decide whether each sentence coordinates or subordinates with the one above it.

Sentences coordinate with each other if one can logically place a coordinating conjunction (and, or, for, but, nor, yet, or so) between them. Sentences subordinate with each other if the second sentence qualifies the first (the second sentence explains how, why, when, where, who, or which). Therefore, at one extreme, a paragraph may be completely coordinating (levels 1-2-2-2-2-etc.) or completely subordinating (levels 1-2-3-4-5-etc.). The more that a paragraph shows a subordinating pattern, the more it will show complexity and development of ideas (Shaughnessy, 1977).

On the other hand, the more that a paragraph shows a coordinating pattern, the more it may indicate ideas that are next to but maybe not connected to other ideas (Brostoff, 1981). The following paragraph taken from John Updike illustrates a typical paragraph when diagrammed:

1 This seems to be an era of gratuitous inventions and negative improvements.

2 Consider the beer can.

3 It was beautiful--as beautiful as the clothespin, as inevitable as the wine bottle, as dignified and reassuring as the fire hydrant.

3 A tranquil cylinder of delightfully resonant metal; it could be opened in an instant, requiring only the application of a handy gadget freely dispensed by every grocer.

4 Who can forget the small, symmetrical thrill of those two triangular punctures, the dainty pfffff, he little crest of suds that foamed eagerly in the exultation of release?

4 Now we are given, instead, a top beetling with an ugly, shmoo-shaped "tab," which, after fiercely resisting the tuggling, bleeding fingers of the thirsty man, threaten his lips with a dangerous and hideous hole.

Neither Christensen nor anyone using his method has attempted to combine both the rhetoric of the sentence and that of the paragraph. Thus, I have modified his system to

put both rhetorics together by creating a network of boxed-in paragraphs and sentences to clarify relationships.

I have encased each paragraph within the entire essay in its own box, which is further divided into smaller boxes to represent the sentences. As the period is the indicator for a sentence boundary, I have chosen to use the period to determine box divisions. Although this looks obvious, it is nevertheless important, for nonfluent writers will often compose run-on sentences or fragments, as illustrated on the Christensen diagram showing nonproficient writing on page 45.

In the case of run-on sentences, I have created divisions between the natural sentence boundaries by leaving a space between natural sentences within each box. Thus, a box encasing a run-on sentence will have more than one sentence enclosed within it.

In the case of fragments, I have perforated the box division between the fragment and its parent sentence. Thus, two or more boxes with perforated lines indicates a natural sentence that has been incorrectly punctuated with a period.

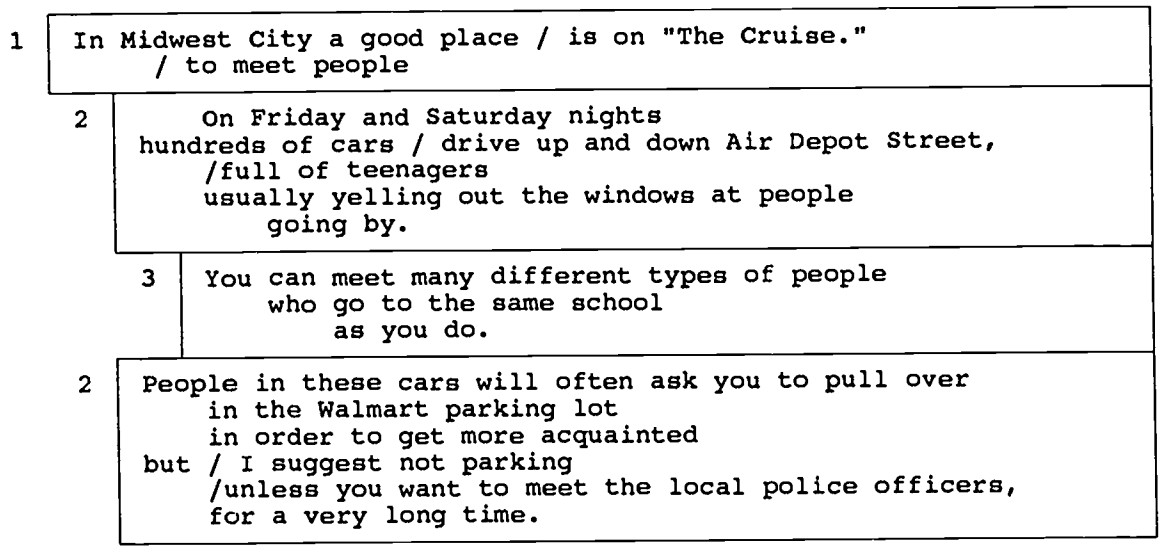
In some of the papers that jump back to level 1 sentences in mid-paragraph, I have also incorporated the following codes by the number indicating the sentence level to clarify sentence relationships:

I	Introduction
P	Proposition or Topic Sentence
T	Transitional Sentence
C	Concluding Sentence

The following paper below shows a Christian Diagram of a paragraph in a somewhat proficient paper.

Proficient Paper

In Midwest City a good place to meet people is on "The Cruise." On Friday and Saturday nights, hundreds of cars full of teenagers drive up and down Air Depot Street, usually yelling out the windows at people going by. You can see many types of people who go to the same school as you do. People in these cars will often ask you to pull over into the Walmart parking lot in order to get more acquainted, but unless you want to meet the local police officers, I suggest not parking for a very long time.



While the diagram lacks the ability to measure the creativity of ideas, it can measure the development of them. The first sentence forms the topic sentence of the paragraph because it introduces and connects the ideas of the Midwest City cruise and meeting people, and for that reason it receives the level-1 position in the diagram.

The second sentence receives a level-2 position because it develops the preceding level-1 sentence by describing <u>when</u> the cruise takes place and <u>what</u> happens there. The various layers of embedded phrases within this level-2 sentence suggest that the student knows how to draw relationships between his ideas, a clear sign of proficient writing for a beginning freshman student. (I have dropped the numbering scheme within to identify levels to avoid cluttering the diagram with conflicting number patterns.)

The main clause containing the basic idea for the sentence is that hundreds of cars drive up and down Air Depot Street, and the other ideas are layered in as they relate to the base idea. The following sentence becomes a level-3 sentence because it describes <u>what</u> can occur when people drive by each other on the cruise.

Again, the two layers of embedded clauses show that the student knows how to connect ideas by drawing

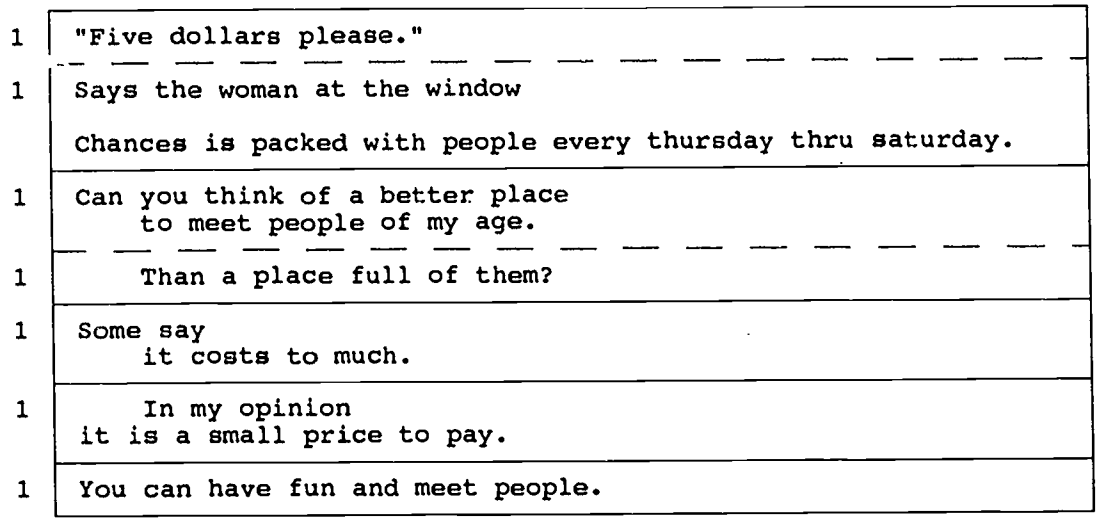
relationships between them. The last sentence in this paragraph becomes a level-2 sentence because it adds onto the idea of the preceding level-2 sentence by introduce two ideas. The sentence thus has two base clauses to show that it is a compound sentence. These two clauses present the ideas that one can pull into the Walmart parking lot, but one must not park too long. All other ideas are subordinate to these two key ideas and are thus indented.

As with the other sentences the student knows how to draw relationships between his ideas by subordinating lesser important ideas to his major ones. The relationships shown by the various layers of boxes and the ideas within these boxes point to a level of proficiency on the part of the writer.

The following paper is written by a nonfluent writer.

Nonproficient Paper

"Five dollars please." Says the woman at the window Chances is packed with people every thursday thru saturday. Can you think of a better place to meet people of my age. Than a place full of them? Some say it costs to much. In my opinion it is a small price to pay. You can have fun and meet people.



The straight sequence of level-1 sentences on the paragraph level suggest that the student cannot express his ideas on paper. Each of the sentences becomes a level-1 sentence because none of the sentences develop any of the ideas in the sentences that preceded them. Rather, each sentence adds an idea of its own, thus forming what Lunsford (1978) calls an extreme coordinate pattern. The series of level-1 sentences on the diagram shows that each sentence promises a new idea that can be developed into its own paragraph, but the leveling effect also shows that the

student has done nothing more than pile sentences by each other, a phenomenon that Brostoff (1981) would describe as pathologic or widely unconnected prose.

Within each box on the diagram, the arrangement of the sentences also suggests that the student cannot order ideas within sentences. While the sentence in the first box suggests a complete idea in the oral mode, it is nonetheless a fragment. As a result, the diagram places the sentence in a box of its own to signify that the student created this idea as a sentence, but the box perforates the box division to show that this idea logically connects with the one following it. In addition, the diagram places both the first sentence, which is the fragment, and the parent sentence in the level-1 position to show that both ideas are equal. (The first fragment is logically a direct object of the second sentence.)

The second sentence is in reality a run-on sentence. Because the writer created this idea as one sentence, the diagram puts both ideas in the same box, but the diagram shows this error by placing both sentences in the same box with a space between the two logical sentences that form the run-on. The two boxes that follow have a perforation between them. To show the reader that the second idea is in fact subordinate to the first sentence, the idea receives a level-2 position to show that it develops the idea of place in the base clause of the preceding sentence.

The use of the perforated line between boxes to indicate fragments and the placing of two separated sentences within boxes to indicate run-ons allows readers to easily see any problems in sentence structure. The relative lack of layers of embedding also allows readers to see that students may not know how to order ideas within sentences.

The diagrams for the proficient and the nonproficient papers allow students to discern differences between well-constructed paragraphs as opposed to those that are not well written. Because these diagrams show relationships in terms that students can understand, teachers can easily diagram the discourse from each student as a means of showing progress and the direction that each successive draft takes as students try to write proficient paragraphs. On a broader scope, these diagrams are also helpful to anchor their scoring practices as leaders try to train readers to evaluate papers holistically when conducting major writing assessments.

In many ways, my system of diagramming based on Christensen's rhetorics of the paragraph and sentence show clearer relationships than do traditional diagramming techniques such as the Reed and Kellogg method of the last century. Not only does Christensen give students principles that they can use to develop their own paragraphs and sentences to make them rhetorically richer, the clear relationships that these diagrams reveal to students make it possible for students to see their paragraphs develop with richer rhetorical relationships. In many ways, the diagrams

show students both the process and the product, the ultimate goal for any process.

REFERENCES

Brostoff, A. (1981). Coherence: 'Next to' is not 'connected to.' CCC, 32, 278-294.

Christensen, F., & Christensen, B. (1967). Notes toward a new rhetoric. New York: Harper and Row.

Christensen, F. (1968). The problem of defining a mature style. EJ, 57, 572-79.

D'Angelo, F. (1975). A conceptual theory of rhetoric. Cambridge: Winthrop.

Lunsford, A. (1978). What we know--and don't know--about remedial writing. College Composition and Communication, 29, 47-52.

Shaughnessy, M. (1976). Basic writing. In G. Tate (Ed.) Teaching Composition: Ten bibliographic essays. (pp. 147-167) Fort Worth: Texas Christian University.

Shaughnessy, M. (1977). Errors and expectations. New York: Oxford University Press.

SOME SUCCESSFUL STRATEGIES FOR DEVELOPMENTAL WRITING TEACHERS

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The cause of success is often failure. Success is failure turned inside out. However, students need help to respond successfully to failure (Hirsh, 14). I share these two aphorisms with my developmental writing students to motivate and encourage them as they cope with the many challenges and demands of college. All developmental writing teachers desire to succeed with their students. It is never an easy job. Sometimes we are forced to adjust our expectations without reducing standards. I have taught developmental writing for the past fourteen years. I mix the traditional with the non-traditional to increase the amount of learning in my classroom. My goal is to help my students become master students as they try to master writing. I provide my students with a detailed syllabus, many writing assignments, a learning center project, art projects, and student conferences. My objective is to help students survive college as well as pass my course as they find new ways of "knowing, accessing, creating and using information" (Scott, 49).

Obviously, a writing teacher desires to instill excellent writing habits in students, but developmental students need to learn how to be successful students as well. The developmental writing class should be a student centered environment. Students need a safe classroom environment (Scott, 54). I try to teach something about life, dreaming about teaching for the stars. In sharing myself, I try to show that I care. I also teach behavior if that is what is needed. Classes vary so much. I have had classes where just about everybody passes and more than half earn B's and A's. There are also those classes from hell where B's are few and grades below C are many.

The syllabus is an important teaching tool and thus must be well designed. Procedures and activities must be spelled out carefully. I go over the document the first two classes. Students sign a contract indicating that they have read the syllabus. The syllabus contains the weekly activities, the readings with the pages listed, a very strict attendance policy, as well as a grading policy which features extra credit opportunities. Progress is emphasized as a significant component in the final grade. I not only include what books to purchase, but what supplies will be helpful. The course takes on a serious tone not to frighten but to demonstrate that the course and teacher are serious. Even the color of

the syllabus is important. When I have a yellow cover, I tell students that we are creating sunshine; a green cover indicates money or treasure. The syllabus serves as a road map helping students to set goals and plot their way through the course. I also have students create a weekly schedule planning homework times and listing their courses for the semester. I collect and evaluate this document.

I give students several written assignments by the second week of classes to discover what skills they have. At the end of the semester, students must pass an exit essay written during two class periods. I usually compare the first in-class essay with the last one. I usually assign seven out-of-class writing assignments along with 18 journal entries. There are usually 3-4 short in-class writings as well.

We begin with the paragraph and end with a research type paper which I call the investigative paper. We work on drafts in class for each paper. Students are permitted to rewrite papers within certain guidelines after the paper has been graded. Allowing students who are unhappy with a grade to rewrite a paper is a good strategy. It quells dissent. What I look for is improvement in the next paper. It is possible to get inundated so control in this area is important. Late work should have penalties imposed. If a penalty is imposed, late papers will be few. My favorite strategy is to take forever to read it. The guilty party will then submit papers on time. Some developmental students may get into the habit of not submitting work on time. Such behavior is likely to lead to failure.

All students are required to do a learning center project--a series of video tapes that focus on writing, grammar, and surviving college. Students choose from 15 activities, 6 videos to view. As part of this assignment students work with writing lab tutors on three of their papers. Students hand in a report of their activities explaining what they have learned. Students are rewarded for any progress made in the course. They will either earn extra points or a gift, for example, a pen or pencil. The main objective is to encourage use of the support services available and to encourage students to take more responsibility for their learning.

I usually assign one project where the students draw or create something to show to the class. Usually students are asked to create a picture of their dream. Some are quite elaborate, some quite simple. We celebrate them all. I try to relate everything to writing as well as education. I set the stage with the props that I bring to class. I may show cereal boxes, toy cars, and bottles. I even have a "Susie Tutor" doll. I use these items to teach a particular concept, or I will ask the students to write about what they see. Later they will be asked to share what they have written. The

goal here is to use as many learning styles as possible--visual, auditory, tactile. Hirsh notes that instructors should tailor learning experiences to meet individual student needs, taking into account individual learning styles (Hirsh, 12). Hirsh discusses sixteen strategies to help students overcome difficult learning histories--many of which have been part of my teaching objectives for years. I also use the overhead projector.

I have used comic strips that deal with student attitudes, spelling, and vocabulary. I have found these comic strips to be excellent in that they simplify grammar with some good humor.

Finally, I schedule at least one formal conference with each student around mid-term. The time is used to chart progress and to discuss joys and concerns. This is an opportunity to praise (or scold). Verbal support is important for ongoing student effort (Hirsh, 12). The appraisal is written. It provides students with some goals to strive for. Students have the opportunity to discuss issues at that time. It is usually time consuming, but worth the time. The open door policy is very important for these students. I believe in prevention, so I will intervene before a major problem occurs. Some of the problems I try to help students work out include: procrastination, poor quality of work, and time management. Those students who are interested in doing well usually appreciate the advice. These students usually achieve their goals. I also make it a point to give praise to those who do well. I find that my developmental writing students need lots of encouragement.

In a developmental writing class, there may be a few sour apples that could poison the entire class with a negative attitude. I spend good deal of time talking about a positive attitude and the kind of behavior I expect. Problems are rare, but that should not be taken for granted. I usually talk about a student who is a teacher's worst nightmare. I try to get students to compare themselves to this person and not make the same mistakes.

My favorite classroom strategy is laughter. According to scholars and researchers, there is educational value in using humor in a classroom. "Retention of concepts is significantly improved by the use of humorous examples illustrating those concepts" (Nicewonder, 32). Because I see humor in everything, it comes easily for me. We often spend a lot of time laughing. Smiling is very important. Caring is perhaps the most important strategy. Students must believe I care. That does not mean I let anyone slide. Developmental educators must realize that "students often list a caring attitude of faculty and staff as one of the top reasons for persisting through degree completion" (Hirsh, 12). Jerrie Cobb Scott writes, "students don't care what we know unless

they know we care" (Scott, 55). Furthermore, students must know there are consequences to inappropriate behavior. If the students are involved in their learning, even during lectures, then they will make a lot of progress.

These strategies that have worked for me may seem like common sense, but I wish that I knew some of these strategies my first year of teaching. I do advocate of structure. All teachers of developmental writers have to look beyond the student's faults and meet the students' needs. The temptation is to relax the standards, but we must not yield. We must design our courses so that our students can meet and perhaps exceed our expectations.

Glenn Hirsh notes that our strategies must give students critical messages which change student behavior, messages like "your individual needs do count here; you can succeed; I care about your success; you will be held accountable. These messages challenge students to break long established negative (attitudes) about the educational process" (Hirsh, 14). Students when empowered do achieve and prosper. The key is to use those teaching strategies that maximize success.

REFERENCES

Hirsh, Glenn, "Helping Students Overcome the Effects of Difficult Learning Histories" Journal of Developmental Education. Winter, 1994. 10-14.

Nicewonder, Chuck. "Humor in the Mathematics Classroom?" Proceedings of the 18th Annual Conference of the National Association for Developmental Education. 1994. 31-32.

Scott, Jerrie Cobb. "Literacies and Deficits Rivisted" Journal of Basic Writing. Vol. 12 No. 1, 1993. 46-55.

CARD GAMES AND MATH CONCEPTS PRODUCE SUCCESSFUL STUDENTS

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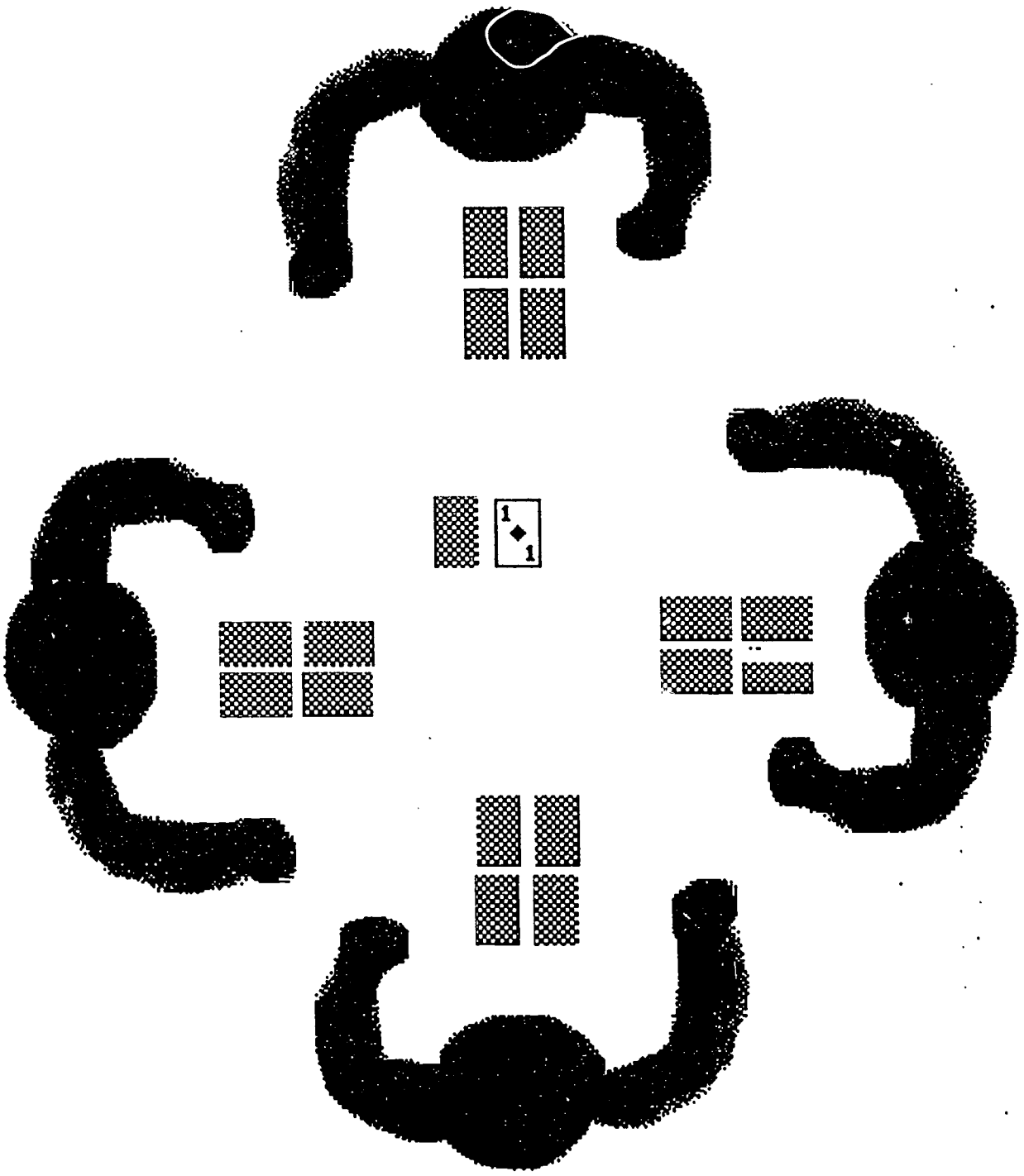
Introduction

I believe that students need varied activities to make the study of mathematics relevant to their lives. One popular group of activities I have used with developmental students involves card games. The games have been used with students beginning instruction with arithmetic operation and skill development needs as well as those beginning an introductory college level algebra course. I have developed a number of variations of goals with a base set of rules. It seems that each year I develop improvements, alternatives, or adjustments that enhance the learning experience for my students. You are invited to do the same. Positive and negative integers, fractions, exponential notation, and decimal notation are some of the topics that can be explored by students actively engaged in the card games described below.

Basic Rules of Play

First note the cards included in the deck. All face cards have been removed. The value for Aces is 1 (one). For some games the Joker may be included with a value of zero (0). The games work best with groups of four students. Fewer than three or more than five students in a group cause problems that should best be avoided. A dealer is selected. The dealer distributes the cards to the players in such a manner that each player has four cards face down in a two by two row and column configuration. The remaining cards are placed face down in a single pile in the center of the group. This becomes the "PICK" pile. A "DISCARD" pile will be established as play begins. All cards discarded are to be placed face up in a single pile. Play rotates to the left of the dealer. In turn, each player picks a card from either the PICK pile or the DISCARD pile. Cards selected from the DISCARD pile must be used to replace one of the held cards. Cards selected from the PICK pile may be used or discarded. Once an exchange begins, it must be followed through. The two cards in the left column are viewed once by the player before the game begins. The other two cards are unknown until they are replaced or revealed at the conclusion of the game. Cards are replaced by the players to meet the objectives of each game. Each card held is maintained face down on the playing table. No cards held are to be viewed during the progression of the game. After the last card is taken from the PICK pile, each



CARD GAME CONFIGURATION

player in turn has the option to continue play by selecting and replacing a card from the discard pile. When a player rejects the DISCARD option, the game ends. Then each player reveals their hand and calculates their score.

HIGH, LOW, NO

This set of games begins with the natural number system then progresses to include positive and negative integers. A description of this activity was presented by this author in A Sourcebook for Developmental Educators published by The Learning Assistance Association of New England (1994). A number of enhancements have been included since then.

At first, each card value is determined only by its number value. For example, all threes have the value three. The first goal for players at this level should be to accumulate the highest possible score by adding the values of each card to obtain a sum which is their score. Additional rules imposed by the instructor should reflect the instructional goals of the session. If the instructor wishes to emphasize the development or enhancement of mental arithmetic skills, students would be restricted from using paper, pencil, and calculators. If the instructor's goals are to review specific arithmetic algorithms, paper and pencil documentation of each round of play may be the rule. I would suggest an "anything goes" round of play before making restrictions on the game so that students can assimilate the rules of play. Some variations at this level could include operations that include addition, subtraction, or multiplication.

To introduce negative numbers, assign black cards a positive value and red cards a negative value. For example, red threes are assigned a negative three value (-3) and black threes are assigned a positive three value (+3). Begin with the highest score as the goal; progress to the lowest possible score; then introduce the goal as being a zero (0) score.

Remove the ten (10) cards and include Jokers assigned zero (0) values. Since each card is a digit, operations with double digit numbers could be performed and games designed with appropriate operational goals. Each series of games should include goals to accumulate the greatest possible score, the lowest possible score, scores of zero, and scores closest to but not equal to zero.

FRACTIONS

Fractions can be constructed using arithmetic operations to combine each player's top two cards to form a numerator and bottom two cards to form a denominator. An option would be to pair left cards to construct one fraction and right cards to construct a second fraction. An arithmetic operation could then be performed using those two fractions. All goals mentioned above could be used to reinforce operations with fractions.

Another goal would be to match a fraction but students find the task simplistic. The game becomes much more challenging when the objective is to construct a fraction not equal to, but closest to the value of the named fraction.

EXPONENTIAL NOTATION

Begin with the simplest goal. All cards are natural number values. Scores are determined by matching cards with the same number value to determine exponential values and adding the remaining card values to that product. For example, someone having three 9's and a four would have a score of 729 + 4 or 733. (Nine to the third power plus 4.) Several days after teaching my children this game (then in grades 3 and 7) I caught them playing it again. They used a calculator to determine their scores and were intrigued with the power exponents had on the value of their scores. High scores and low scores should be stated goals. Include the removal of ten cards and the inclusion of Jokers for zero values. Amend the rules to assign positive (black card) and negative (red card) values. Include an option that explores negative exponents.

DECIMAL NOTATION

Decimal fractions are constructed using suits to determine place value of the various number values displayed on the cards. For this game define Hearts as tenths, Diamonds as hundredths, Clubs as thousandths, and Spades as ten thousandths. The value of a set containing the nine of Hearts, the eight of Diamonds, the seven of Clubs, and the six of Spades would be 0.9876. Set goals to achieve the greatest value and least value with various arithmetic operations. If students need to work with decimal notation of positive and negative values, the red suits could be identified as negative values and black suits positive values. Hearts and Spades would be defined as tenths with Diamonds and Clubs defined as hundredths.

ROLE OF THE INSTRUCTOR

The instructor becomes a "facilitator of learning". You do not lecture. You do not answer all questions posed. Demand student exploration before confirming their findings. Make students aware of what they are doing by reviewing what their thoughts were as they progressed through each game. Have students note their personal anxiety levels as they encounter and master each game. Encourage discourse during the game that clarifies your objectives. Review strategies used by successful students to reinforce the mathematical concepts explored. Do not permit gambling (my last class had money on the table before I had finished explaining the rules). Structure and control the activity so that the focus is mathematics. Ask leading questions. (My favorite is Why?) You may wish to have students document their scores or present their score on a number line. Permit student interaction. Have each student write their reflections on the learning that occurred. Make students aware of the amount of work they just did and the amount of enjoyment they had while doing that work. Have fun!

REFERENCES

Hrabovsky, P.E. (1994). Learning activities in developmental math classrooms: Computers, cards, and cooperative quizzes. In: I. Anderson (Ed.), A sourcebook for developmental educators, The Learning Assistance Association of New England, Manchester, NH.

HELPING STUDENTS TO BE ORGANIZED WHEN TAKING MATH TESTS

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"Modern Math"!?* Many of us have memories of the term "Modern Math". Some of us were students during the late 60's and 70's, while others were teaching during that time when the craze was modern math. My first teaching assignment and many assignments thereafter included algebra with an emphasis on using all the properties of the number system, properties such as commutative property, associative property, additive identity, addition property of equality, and others. As I taught my students how to solve problems, I constantly asked them to use one of the properties to verify what they had done. As I did this, I was teaching my students more than a method of solving equations; I was teaching them how to think.

A conversation with a colleague of mine reminded me of this fact. One day I asked this fellow teacher how his son was doing; his son was a former student of mine. Bob, the son, had been in an algebra class I had taught during my first teaching assignment. He is now a successful medical doctor in the field of cancer treatment. As part of the answer to my question, my colleague said, "Bob always gives you credit for teaching him how to think." It is my premise that we ,as teachers of mathematics in developmental education, should not only teach mathematics (concepts of material), but we should also teach our students how to think, especially in reference to taking tests.

Research Supports Reducing Complexity

Tom Jenkyns(1995), of Brook University in Ontario, Canada, teaches a number of freshman service courses in mathematics, including statistics to social science students, calculus to business students, and discrete math to education

students. He has said, "For many of these students, taking a mathematics course means engaging in a sort of battle, with all the accompanying anxiety, risk of humiliation, fear, and loathing"(p.5). He used a military analogy to give them advice about how to write and prepare for tests and exams, partly to amuse them and partly to authenticate their feelings, but mainly to provide a context in which they may deliberately act to control their fate(Jenkyns,1995). He has asserted, "My job is to empower them to defeat the enemy"(Jenkyns, 1995, p.5). My own job, as a developmental educator, is to empower students by using an outline or some other tool to condense the material that has been presented.

Donald M. Blais(1995) also provides supportive material for condensing the material presented in math lessons. He has observed, "Through the prism of elemental psychological theory, the failure to become good at mathematics may be seen as a failure to develop appropriate selectivity. Effective developmental instruction must include changing what mathematic students pay attention to, thereby helping them to think in more selective and efficient ways"(p.3). The implications of these insights is that, "mathematical thinking depends upon the acquisition and use of a variety of techniques for reducing the complexity of mathematical material"(Blais, 1995). In essence the message is, "less capable students work to exhaustion on material that capable students mostly ignore"(Blais, 1995).

Techniques to Reduce Complexity

Flowcharts and outlines are two techniques for reducing the complexity of the material. When a flowchart is used it sequences steps to follow as well as highlights specific formulas or procedures that are needed to solve the problems. In short, it organizes the material. When an outline is used, it organizes the material like the flowchart, but it also indicates the importance of the various topics. For example, an outline always indicates primary topics, secondary topics, tertiary topics and more if needed. This

gives the student a clearer view of the whole unit.

Students can use these techniques to be more selective and efficient in their thinking when they are performing tasks in three different areas of their studying. One is during individual lessons, a second is when they are preparing for a unit test, and the third is when they are preparing for a final.

An effective example of a lesson involves factoring. A flow chart summarizes several lessons.(Insert exhibit #1 here). As a climax of these lessons, students should use five methods presented previously to completely factor the polynomials seen in the following list.

$3y^2 - 48$

$2ax + 3 + x + 6a$

$2x^2 - 64x + 512$

$64x^3 - 1$

$2x^3 - 3x^2 + 2x - 3$

$3y^2 - 81y^4$

The flow chart presents these five methods and gives an organized way of thinking that the student can use. As students use the flow chart, they begin to internalize it; thus, it becomes a very useful tool.

The challenge for the students is how to remember this flow chart. In many instances, students ask if they can have the flow chart available when they are taking the test. "No" is always my answer, but I tell them, "I will show you how to outline the chart". I tell them to look at the chart closely(Insert exhibit #1 here). There are four major topics in factoring:

I. Removing the greatest common factor

II. Factoring Binomials

III. Factoring Trinomials
IV. Factoring any other polynomial

When students examine the flow chart closely, they observe the answer "Yes" to the question, "Is the remaining polynomial a binomial?" At this point the chart deals with several forms of binomials. Therefore, the outline would now look like:

I. Remove the greatest common factor.
II. Factor Binomials
  A. Difference Of Square
    $A^2-B^2 = (A-B)(A+B)$
  B. Difference of Cubes
    $A^3-B^3 = (A-B)(A^2+AB+B^2)$
  C. Sum of Cubes
    $A^3+B^3 = (A+B)(A^2-AB+B^2)$
III. Factor a trinomial into 2 binomials
IV. Factor any other polynomial by grouping and factoring

This outline is easier to remember than the flow chart because it condenses the flow chart into an outline form.

When instructors explain to students how to condense material such as the flow chart, they are really sharing with the students the way in which they think. In *Women's Ways of Knowing* , the authors have reported that "students are permitted to see the products of their instructors' thinking, but the process of gestation is hidden from view. The lecture appears as if by magic"(Belenky, Clinchy, Goldberger, Tarule,1986,p.215). "So long as the teachers hide the imperfect processes of their thinking, allowing their students to glimpse only the polished products, students will remain convinced that only Einstein- or a professor- could think up a theory"(Belenky, et .,1986,p.215). They continued "We think the revelation that the professors are not omnipotent might come sooner if those of us who teach could

find the courage to think out loud with our students" (Belenky,et al.,1986,p.216).

An example of using the outline to prepare for a unit test occurs when solving open sentences in one variable. Many students have difficulty knowing where to begin when confronted with a list of problems like the following.

$3x^2 - x = 2$ $\qquad$ $x^3 = x^2 - x + 1$

$\frac{2x - 3}{3} = \frac{2 - x}{x}$ $\qquad$ $\frac{1}{x-1} + \frac{1}{x+1} = \frac{1}{x^2-1}$

$3(2x-5) = 4(3x+2)$ $\qquad$ $5-2[3+6(2x+5)] = 3(4x-6)$

$\sqrt{x-3} = x - 1$ $\qquad$ $\sqrt{2x-5} - \sqrt{x} = 2$

$|x-5| > 12$ $\qquad$ $|3x+7| \leq x$

The unit that presents the methods of solving these open sentences can be condensed by using the outline in exhibit #2.(Insert exhibit #2 here.) When examining the outline closely, students discover that really only five different types of problems exist in this unit. When students proceed to solve the problems in the given list, the first thing they need to do is to decide which one of the five types they are solving. Then they proceed with the method of finding the solution. After checking exhibit #2 (Insert exhibit #2 here.) closely, students discover that three things (at most) need to be done to solve each problem. The outline reduces the material that seems to be overwhelming to five types of problems, with only three steps to follow for each type of problem.

This tactic very easily assists students in preparing for the semester final. Usually three or four units are covered in a semester. Each unit will consist of five to ten different types of problems. In order to solve a specific type of problem, students usually must perform three to five steps. When a semester's work is considered in this way, it

is very conducive to developing an outline as a tactic for taking a test.

Success of Techniques

This approach of preparing for exams has proven to be successful for students in my algebra classes. One example involves a girl who had only the first level of algebra in high school. As she began the sequence of algebra courses (Introductory Algebra, Intermediate Algebra, and College Algebra), she experienced high levels of anxiety. Although she was a very dedicated student, she never achieved the results she desired. One day, as I was tutoring her, I suggested that she outline the unit when she prepared for the test. Her reaction was, "Oh, you mean use 3x5 cards and summarize each section." It was as if the proverbial light had suddenly turned on. As a result, she experienced improved performance on the exam. With hard work and the use of this method of preparing for a test, she completed College Algebra with a passing grade.

Another example concerned a non-traditional student who was frightened about taking College Algebra. During the first week of classes, he requested a full time tutor. As the semester progressed, I suggested the outline procedure to the tutor and encouraged her to use it with the student. The student used it on the first several tests and was pleased with the results. The outline gave him confidence, and, by the end of the semester, the tutor pronounced her tutelage unnecessary. He completed the course with a high C and was very pleased.

The tactic of outlining when preparing for a test works for many students. As students develop this approach, they see a larger picture and do not become bogged down with all of the minor details.

References

Belenky, M.F., Clinchy, B.M., Goldberger, N.R., & Tarule, J.M. (1986). Woman's ways of knowing. New York: Basic Books.

Blais, D. (1995). Elemental psychology and the teaching of mathematics. Journal of Developmental Education, 18 (3), 2-8.

Gardner, H. (1991). The unschooled mind. New York: Basic Books.

Jenkyns, T. (1995). Tactics for tests. The Teaching Professor, 9(1), 5-6.

Exhibit 1

FLOW CHART FOR FACTORING

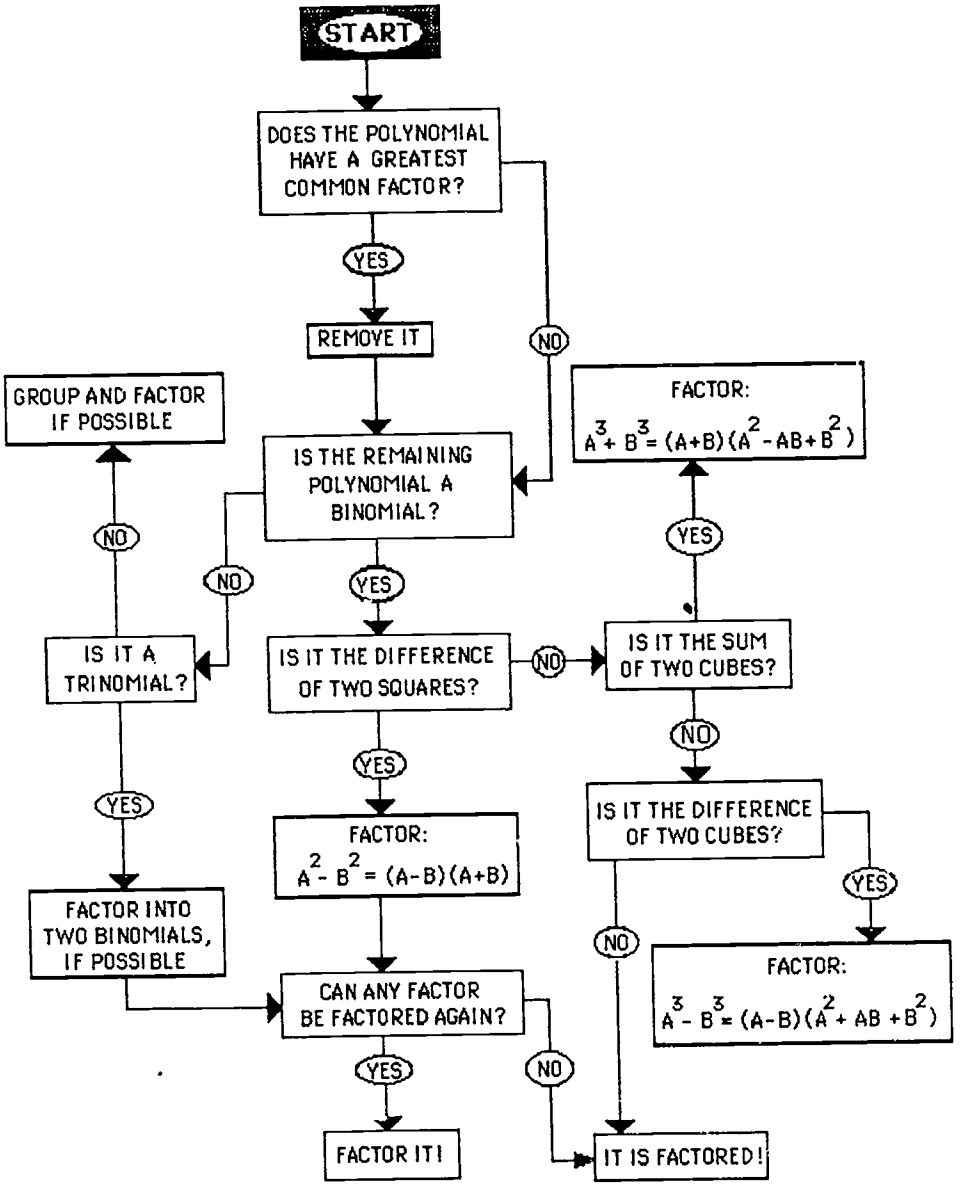

Exhibit # 2

Solve open sentences in Algebra

A. Linear equations
   1. Distribute
   2. Addition and Multiplication properties of equality

B. Quadratic equations
   1. Factor
      a) Greatest Common Factor
      b) Binomials
         1) Difference of Squares
         2) Difference of Cubes
         3) Sum of Cubes
      c) Trinomials
   2. Quadratic Formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

C) Rational Equations
   1. Find the Greatest Common Denominator(GCD)
   2. Multiply both sides of the equation by the GCD
   3. Check that no solutions cause the denominators of the original equation to be zero.

D. Equations with $\sqrt{}$
   1. Isolate $\sqrt{}$
   2. Square both sides of the equation
   3. Check all results in original equation

E. Absolute value inequalities
   1. Given $|A| = c$
      write as $A = c$ or $A = -c$ and solve
   2. Given $|A| < c$
      write as $-c < A < c$ and solve
   3. Given $|A| > c$
      write as $-c < A$ or $A < c$ and solve